

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Housing - Federal Housing Commissioner

Series and Series Number:
MATERIALS RELEASE NO: 1323

TO: DIRECTORS, SINGLE FAMILY HOCs
DIRECTORS, MULTIFAMILY HUBs

ISSUE DATE

June 4, 2007

REVIEW DATE

June 4, 2010

SUBJECT: 1. **Product** CertainTeed Corporation Weatherboards™ FiberCement Siding

2. **Name and address of Manufacturer** CertainTeed Fiber Cement Plant CertainTeed Fiber Cement Plant
Box 98, Hwy 268 P.O. Box 2455, 1200 Avenue G
Roaring River, NC 28669 White City, OR 97503

Data on the nonstandard product described herein have been reviewed by the Department of Housing and Urban Development (HUD) and determination has been made that it is considered suitable from a technical standpoint for the use indicated herein. This Release does not purport to establish a comparative quality or value rating for this product as compared to standard products normally used in the same manner.

This Materials Release cannot be used as an indication of endorsement or approval by HUD of the described product, and any statement or representation, however made, indicating such approval or endorsement by HUD is unauthorized. See Code 18, U.S.C. 709.

Any reproduction of this Release must be in its entirety.

USE:

Exterior wall covering and soffits.

DESCRIPTION:

CertainTeed Corporation, fiber cement WeatherBoards™ products are autoclaved, single-faced wall covering manufactured from a proprietary mixture of cellulose fiber, portland cement, silica, clay or fly ash and limestone. The product covered by this MR is WeatherBoards™ FiberCement Siding and Trim.

APPLICABLE REFERNCE STANDARDS:

CertainTeed Corporation Weatherboards™ FiberCement Siding and Trim shall comply with the following standards:

ASTM C 1186-02, Flat Non-Asbestos Fiber Cement Sheets

ASTM E-84-94, Flame Spread

ASTM E 72-02, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

ASTM E 119-00, Test Methods for Fire Tests of Building Construction and Materials

ASTM E 136-99, Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

ASTM E 330-97, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by uniform Static Air Pressure Difference

ASTM E 331-00, Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference

ASTM G 153-00a, Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

ASTM G 155-00A, Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials

INSTALLATION:

CertainTeed Weatherboards™ FiberCement Siding and Trim shall be installed over nominally 2-inch thick lumber or minimum No. 20 gage, 33 ksi steel, C-stud framing member and in accordance with Table 1, Table 2, manufacturer's installation instructions, and this MR. A water resistive barrier shall be installed under the siding.

Fasteners shall be spaced in accordance to the manufacture's specification. Fasteners shall be corrosion-resistant. Fasteners shall be sized per Tables 1 and 2 of this MR. Fastener length shall be increased to provide a minimum 1¼ - inch penetration into framing, where nonstructural or nonfastener base structural sheathing is used under the siding. Blind fastening on lap siding is accepted, when installed according to Table 1 and Figure 1 of this MR.

Exterior walls of construction Types I, II, III, IV and V are permitted to be constructed from WeatherBoards™ for wind pressure resistance or wind speed exposures as indicated in the manufacturer's compliance report and approved installation instructions. Siding shall be installed over approved sheathing or material where specified and shall provide the building with a weather-resistant exterior wall envelope.

The WeatherBoards™ and accessories are to be installed according to the manufacturer's instructions, so that allowable transverse wind load pressure (based on the siding size, framing spacing, and fastening schedule) as indicated in Table 1 exceeds wind pressure design as noted in Table 3 and Table 4. In addition, the allowable fastener withdrawal capacity, as depicted in Table 2, (specified for the assembly in Table 1 and based on fastener type, penetration, and framing species) shall be greater than the minimum fastener load in pounds per fastener, as specified in Table 1.

ONE HOUR FIRE-RESISTANCE ASSEMBLY:

When constructed in accordance to Figure 2 of this MR, the lap and vertical panel siding products are recognized as being one-hour, fire-resistance-rated, limited-load-bearing, wood-stud wall assemblies. Wall design is to be in accordance with the allowable stress design, of the National Design Specification of Wood Construction (NDS).

The axial load allowed for wall assembly construction with lap siding will be the lesser of the following:

- (a) the allowable axial design stress is to be 49 percent or less;
- (b) construction of an embraced wall with a height of 9 feet 1,200 pounds per 2x4 studs when using No. 2 SPF as specified in the 1997 NDS;
- (c) $0.78 F'_c$; or
- (d) 0.78 of the stress as calculated for studs with a slenderness ratio le/d of 33.

The allowable axial load for a wall assembly constructed with vertical panel siding is the lesser of the following:

- (a) 73.4 percent of the allowable axial design stress
- (b) wall construction with an embraced height of 9 feet, 1,800 pounds per 2x4 No. 2 SPF in accordance with the 1997 NDS code; or
- (c) $0.78 F'_c$ or
- (d) 0.87 of the stress calculated for studs with a slenderness ration le/d of 33.

CONDITIONS OF WEATHERBOARD PRODUCT USAGE:

1. The WeatherBoards™ products shall be installed according to this MR and the instructions of the manufacturer.
2. Except as noted, the WeatherBoards™ products shall be of Type V construction (combustible).
3. WeatherBoards™ products that have not been evaluated for racking resistance must be braced by other means.

PRODUCT CERTIFICATION AND IDENTIFICATION:

CertainTeed shall certify that WeatherBoards™ FiberCement conforms to the requirements of this MR. The SGS U.S. Testing Company Inc. is the independent quality control agency that is contracted to conduct unannounced quarterly inspections of the plants. Random sampling is conducted quarterly with testing done by the independent quality agency. Applicable ASTM standards for fiber cement products will be used to evaluate the samples

Each CertainTeed product named in this MR shall be marked with the following information

2. CertainTeed Corporation
2. The SGS U.S. Testing Co. Inc. trademark
3. The manufacturer's conformance to this MR
4. The date of manufacture

MANUFACTURING LOCATIONS:

The product covered under this MR will be produced at the following plant(s):

CertainTeed Fiber Cement Plant
Box 98
Hwy 268
Roaring River, NC 28669
Phone (336) 696-2007

CertainTeed Fiber Cement Plant
P.O. Box 2455
1200 Avenue G
White City, OR 97503
Phone (541) 826-5867

WARRANTY:

CertainTeed has Limited, Prorated, and Transferable Warranty. CertainTeed warrants its WeatherBoards™ FiberCement Siding primed with FiberTect to be free from manufacturing defects during the 50-year period following its installation. CertainTeed will pay to repair or replace, at its option, any WeatherBoards™ FiberCement Siding determined to be defective during the 50-year period following the installation as the Warranty Prorationing Schedule, from 0-2 years 100%, from 3-50 years, 2% reduction from original purchase price each year since the installation.

The manufacturer's warranty does not, in any way, relieve the builder of responsibility under the terms of the Builder's Warranty required by the National Housing Act or under any provisions applicable to any other housing program. A copy of the manufacturer's warranty shall be furnished by the builder to the owner upon completion of the property.

MANUFACTURER'S RESPONSIBILITIES:

Issuance of this Materials Release (MR) commits the manufacturer to fulfill, as a minimum, the following:

1. Produce, label and certify the material, product or system in strict accordance with the terms of this MR.
2. Provide necessary corrective action in a timely manner for all cases of justified complaint, poor performance or failure reported by HUD.
3. When requested, provide the FHA Standards, Office of Manufactured Housing Programs, HUD Headquarters, with a representative list of properties in which the material, product or system has been used, including complete addresses or descriptions of locations and dates of installation.
4. Inform HUD, in advance, of changes in production facilities, methods, design of the product, company name, ownership or mailing address.
5. If in the interval between the annual review of the QCM, significant changes are made to the product which would be definition revise the previously recognized facts, HUD will be informed within 30 days of formal implantations of these significant changes

EVALUATION:

This MR shall be valid for a period of three years from the date of initial issuance or most recent renewal or revision, whichever is later. The holder of this MR shall apply for renewal or revision 90 days prior to the Review Date printed on this MR. Submittals for renewal or revision shall be sent to:

U. S. Department of Housing and Urban Development
FHA Standards, Office of Manufactured Housing Programs
451 Seventh Street, SW, Room 9168
Washington, DC 20410-8000

Appropriate User Fee shall be sent to:

U. S. Department of Housing and Urban Development
Miscellaneous Income – Technical Suitability of Products Fees
Bank of America
P. O. Box 198762
Atlanta, GA 30384-8762

The holder of this MR may apply for revision at any time prior to the Review Date. Minor revisions may be in the form of a supplement to this MR.

If the Department determines that a proposed renewal or supplement constitutes a revision, the appropriate User Fee for a revision will need to be submitted in accordance with the Code of Federal Regulations 24 CFR 200.934, "User Fee System for the Technical Suitability of Products Program," and current User Fee Schedule.

CANCELLATION:

Failure to apply for a renewal or revision shall constitute a basis for cancellation of the MR. HUD will notify the manufacturer that the MR may be canceled when:

- conditions under which the document was issued have changed so as to affect production of, or to compromise the integrity of, the accepted material, product, or system;
- 2. the manufacturer has changed its organizational form without notifying HUD; or,
- 3. manufacturer has not complied with responsibilities it assumed as a condition of HUD's acceptance.

However, before cancellation, HUD will give the manufacturer a written notice, of the specific reasons for cancellation, and the opportunity to present views on why the MR should not be canceled. No refund of fees will be made on a canceled document.

This Materials Release is issued solely for the captioned firm, and is not transferable to any person or successor entity.

Table 1
Ultimate Wind Loads for Exterior Wall Cladding

| PRODUCT | Thickness | FASTENER TYPE ³ | FASTENING METHOD ¹ | FRAMING TYPE | FRAMING SPACING (in) | ULTIMATE LOAD (psf) ² |
|-------------------|-----------|--|-------------------------------|---|----------------------|----------------------------------|
| Vertical Siding | 5/16 | 8d nails, HD Galv. | 4" edge 8" field | 2x 4 #2 SPF | 16 | 152 |
| Vertical Siding | 5/16 | 8d nails, HD Galv. | 4" edge 8" field | 2x 4 #2 SPF | 24 | 133 |
| Vertical Siding | 5/16 | 6d nails, HD Galv. | 4" edge 8" field | 2x4 #2 SPF | 16 | 131 |
| Vertical Siding | 5/16 | 6d nails, HD Galv. | 4" edge 8" field | 2x4 #2 SPF | 24 | 92 |
| Vertical Siding | 5/16 | 6d nails, HD Galv. | 6" edge 12" field | 2x 4 #2 SPF | 16 | 105 |
| Vertical Siding | 5/16 | 6d nails, HD Galv. | 6" edge 12" field | 2x 4 #2 SPF | 24 | 72 |
| <= 12" Lap Siding | 5/16 | 8d nails, HD Galv. | Face nailed | 2x 4 #2 SPF | <= 24 | 148 |
| <= 12" Lap Siding | 5/16 | 1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500 | Blind screwed | Min. 20 ga., 3.625" x 1.375" Metal C-stud | 16 | 70 |

| | | | | | | |
|----------------------|------|--|---------------------------------|---|-------|-----|
| | | | | | | |
| <= 9 1/4" Lap Siding | 5/16 | 8d nails, HD Galv. | Face nailed | 2x 4 #2 SPF | 16 | 228 |
| <= 9 1/4" Lap Siding | 5/16 | 7d nails, HD Galv. | Face nailed | 2x4 #2 SPF | 16 | 205 |
| 9 1/4" Lap Siding | 5/16 | 6d 2" Roofing nails, HD Galv. | Blind nailed | 2x 4 #2 SPF | 16 | 109 |
| <= 9 1/4" Lap Siding | 5/16 | 1 5/8", steel, self-tapping screw, 3/8" phillips head, ITW Buildex "Rock-On" S-12 #2159500 | Blind screwed | Min. 16 ga., 3.625" x 1.375" Metal C-stud | 16 | 96 |
| 8 1/4" Lap Siding | 5/16 | 6d 2" Roofing nails, HD Galv. | Blind nailed | 2x4 #2 SPF | 16 | 122 |
| 8 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed | 2x Lumber #2 SPF | 16 | 96 |
| <= 8 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed w/ Off-Stud Joiner | 2x Lumber #2 SPF | 16 | 110 |
| 8 1/4" Lap Siding | 5/16 | .100"x1.5" Knurled pins, .3125" head, ET&F #AGS-100-0150NA | Blind nailed | Min. 20 ga., 3.625" x 1.375" Metal C-stud | 16 | 57 |
| <= 7 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed | 2x Lumber #2 SPF | 16 | 193 |
| 7 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed | 2x Lumber #2 SPF | <= 24 | 70 |

| | | | | | | |
|-------------------|------|------------------------------|--------------|------------------|-------|-----|
| | | | | | | |
| 6 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed | 2x Lumber #2 SPF | <= 24 | 95 |
| 5 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed | 2x Lumber #2 SPF | 16 | 132 |
| 5 1/4" Lap Siding | 5/16 | 6d nails, HD Galv. | Blind nailed | 2x Lumber #2 SPF | 24 | 92 |
| Shapes Siding | 5/16 | 6d Ring shank nail, HD Galv. | Blind Nailed | 2x Lumber #2 SPF | <= 24 | 83 |

For SI: 1 inch = 25.4mm, 1 pound/foot² = 47.8803 kPa: 1 pound = 4.448N.

¹ Face Nailed is fastened through overlap. Blind Nailed is fastened through top edge of plank.

² Values determined by testing in accordance with ASTM E72.

³. All fasteners shall be corrosion resistant.

Table 2
ULTIMATE FASTENER WITHDRAWAL CAPACITY (pounds)^{1,2}

| Fastener | Product Application | | Framing Material ³ | | | | | |
|---|----------------------------|--------------|-------------------------------|----------------------|--------------------------------|----------------------------|-------------|-----------|
| | | | Spruce-Pine-Fir 0.42 s.g. | Hem-Fir 0.46 s.g. | Douglas Fir-Larch 0.50 s.g. | Southern Pine 0.55 s.g. | 20 ga Steel | 7/16" OSB |
| 6d Box Nail | Lap Siding - Blind Nailed | | 130.0 | 162.0 | 194.0 | 250.0 | --- | --- |
| | Panel | | 130.0 | 162.0 | 194.0 | 250.0 | --- | --- |
| 8d Box Nail | Lap Siding - Face Nailed | | 162.0 | 198.0 | 252.0 | 345.0 | --- | --- |
| | Panel | | 189.0 | 231.0 | 294.0 | 375.0 | --- | --- |
| 1 3/4" Roofing Nail | Lap Siding - Blind Nailed | | 131.0 | 162.0 | 203.0 | 259.0 | --- | --- |
| | Panel | | --- | --- | --- | --- | --- | --- |
| 6d Nail Maze Nails #200 HD-018 | Lap Siding - Blind Nailed | | 120.0 | --- | --- | --- | --- | 48.0 |
| | Panel | | 120.0 | --- | --- | --- | --- | 48.0 |
| 7d Nail Maze Nails #225 HD-022 | Lap Siding - Face Nailed | | 116.0 | --- | --- | --- | --- | 33.0 |
| | Panel | | 116.0 | --- | --- | --- | --- | 33.0 |
| 8d Nail Maze Nails #C-CEM8 | Lap Siding | Face Nailed | 136.0 | --- | --- | --- | --- | --- |
| | | Blind Nailed | 136.0 | --- | --- | --- | --- | --- |
| | Panel | | 136.0 | --- | --- | --- | --- | --- |
| 6D Roofing Nail Maze Nails #HD-105 | Lap Siding - Blind Nailed | | 178.0 | --- | --- | --- | --- | 84.0 |
| | Panel | | 178.0 | --- | --- | --- | --- | 84.0 |
| 1-1/2" Ring Shank Roofing Nail Maze Nails #R103-A | Lap Siding - Blind Nailed | | --- | --- | --- | --- | --- | 41.0 |
| | Panel | | --- | --- | --- | --- | --- | 41.0 |
| 6d Ring Shank Maze Nails #C-S205A | Lap Siding - Blind Nailed | | 163.0 | --- | --- | --- | --- | 49.5 |
| | Panel | | 163.0 | --- | --- | --- | --- | 49.5 |
| .100"x1 1/2" Pins ET&F #AGS-100-0150NA | Lap Siding | Face Nailed | --- | --- | --- | --- | 105.0 | --- |
| | | Blind Nailed | --- | --- | --- | --- | 105.0 | --- |
| | Panel | | --- | --- | --- | --- | 105.0 | --- |
| 1 5/8" Screws ITW Buildex "Rock-On" S-12 | Lap Siding - Blind Screwed | | --- | --- | --- | --- | 178.0 | --- |

| Fastener | Product Application | Framing Material ³ | | | | | |
|---|----------------------------|-------------------------------|----------------------|--------------------------------|----------------------------|-------------|-----------|
| | | Spruce-Pine-Fir 0.42 s.g. | Hem-Fir 0.46 s.g. | Douglas Fir-Larch 0.50 s.g. | Southern Pine 0.55 s.g. | 20 ga Steel | 7/16" OSB |
| | Panel | --- | --- | --- | --- | 178.0 | --- |
| 1 5/8" Screws ITW Buildex "Rock-On" Hi-Lo | Lap Siding - Blind Screwed | --- | --- | --- | --- | --- | 152 |
| | Panel | --- | --- | --- | --- | --- | 152 |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448N.

¹ Where nonstructural sheathing is located under the siding, the length of the fastener must be increased an equivalent length so as to provide the required 1 1/4-inch fastener penetration.

² 6d Box and 8d Box nails are hot-dipped galvanized box nails. 1 3/4" Roofing nails are minimum 1 3/4 - inch long, stainless steel or hot-dipped galvanized nails having a head diameter or 3/8 inch.

³ Framing materials listed indicate minimum specific gravity (s.g.) for wood stud species and gauge (ga) for steel studs.

TABLE 3
NET DESIGN WIND PRESSURE (COMPONENT AND CLADDING)

| Zone | Effective wind Area | Basic Wind Speed V (mph-3-second gust) | | | | | | | | |
|------|---------------------|---|-------|-------|-------|-------|-------|-------|-------|-------|
| | | 85 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 170 |
| 5 | 10 | -17.4 | -19.5 | -24.1 | -29.1 | -34.7 | -40.7 | -47.2 | -54.2 | -69.6 |
| 5 | 20 | -16.2 | -18.2 | -22.5 | -27.2 | -32.4 | -38.0 | -44.0 | -50.5 | -64.9 |
| 5 | 50 | -14.7 | -16.5 | -20.3 | -24.6 | -29.3 | -34.3 | -39.8 | -45.7 | -58.7 |
| 5 | 100 | -13.5 | -15.1 | -18.7 | -22.6 | -26.9 | -31.6 | -36.7 | -42.1 | -54.1 |
| 5 | 500 | -10.8 | -12.1 | -14.9 | -18.1 | -21.5 | -25.2 | -29.3 | -33.6 | -43.2 |

TABLE 4
ADJUSTMENT FACTOR FOR BUILDING HEIGHT AND EXPOSURE

| Mean Roof Height (feet) | Exposure | | |
|-------------------------|----------|------|------|
| | B | C | D |
| 15 | 1.0 | 1.21 | 1.47 |
| 20 | 1.0 | 1.29 | 1.55 |
| 25 | 1.0 | 1.35 | 1.61 |
| 30 | 1.0 | 1.40 | 1.66 |
| 35 | 1.05 | 1.45 | 1.70 |
| 40 | 1.09 | 1.49 | 1.74 |
| 45 | 1.12 | 1.53 | 1.78 |
| 50 | 1.16 | 1.56 | 1.81 |
| 55 | 1.19 | 1.59 | 1.84 |
| 60 | 1.22 | 1.62 | 1.87 |

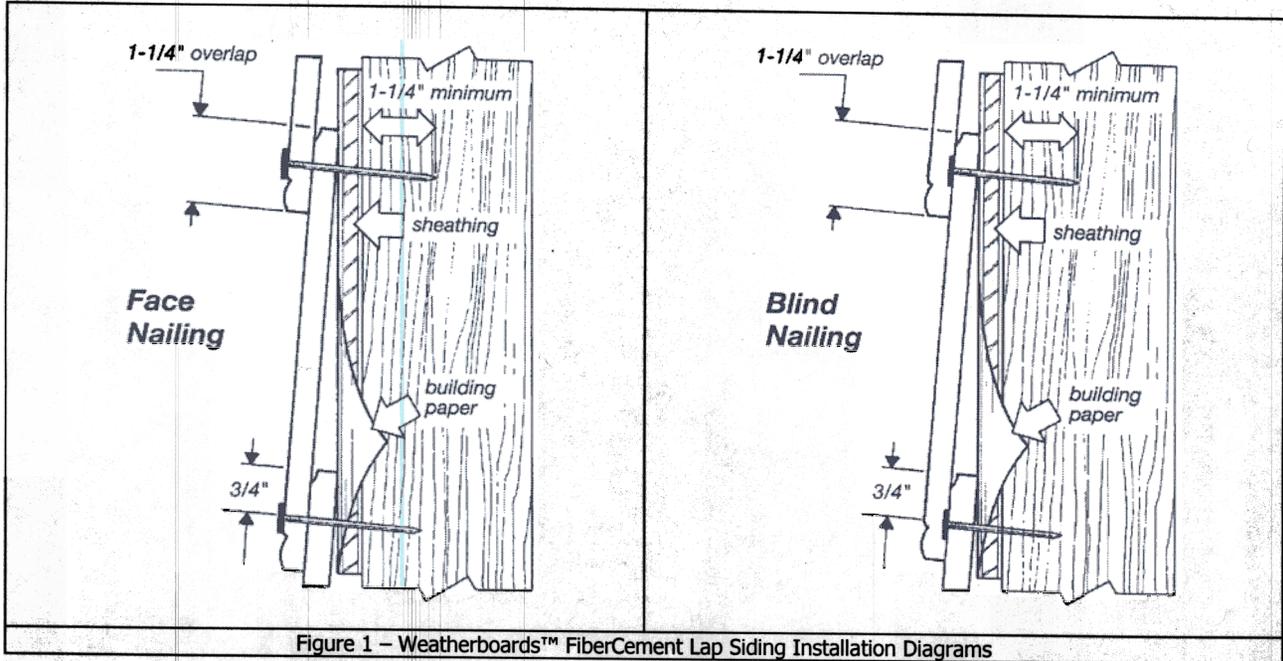
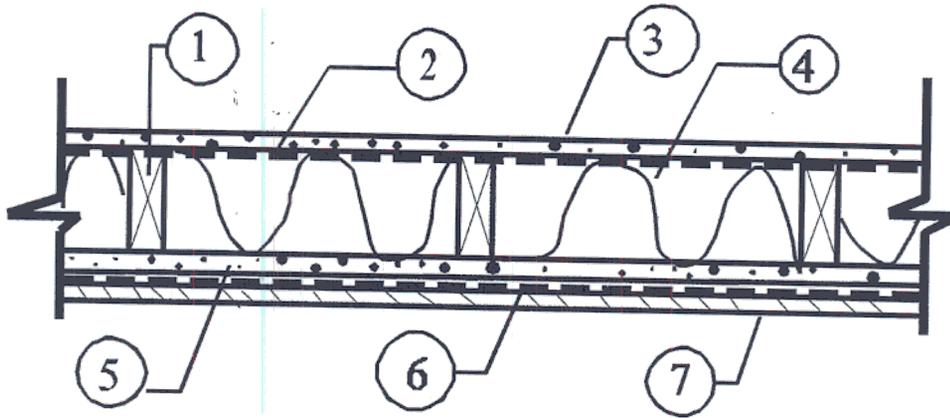


Figure 1 – Weatherboards™ FiberCement Lap Siding Installation Diagrams



- ITEM 1:** Allowable axial load for a wall assembly constructed with WeatherBoards™ FiberCement Lap Siding shall be 49 percent or less of the allowable axial design stress calculated in accordance with the *National Design Specification for Wood Construction* (This equates to 1,200 lbs, (5335 N) per 2x4 or 228.5 psi (1.57 N/mm²) when No. 2 Southern Pine studs are used in the construction of a wall having an unbraced height of 9 ft (2.7 m)). Allowable axial load for a wall assembly constructed with WeatherBoards™ FiberCement Vertical Siding shall be 73.4 percent or less of the allowable axial design stress calculated in accordance with the *National Design Specification for Wood Construction* (This equates to 1800 lbs (8000 N) per 2x4 stud or 342.9 psi (2.37 N/mm²) when No. 2 Southern Pine studs are used in construction of a wall having an unbraced height of 9 ft (2.7 m)).
- ITEM 2:** Continuous vapor barrier in accordance with the applicable code and the manufacturer's instructions.
- ITEM 3:** Interior side of wall assembly shall be covered with 5/8-inch thick ASTM C36-95b Type X gypsum wall board. Wall board shall be fastened to wood framing with 1 5/8-inch long No. 6 Type W drywall screws spaced 8 inches on center at the edges and 12 inches in center in the field. All screw heads covered with joint compound and all wallboard joints shall be covered with joint compound and taped and treated with joint compound. Joint compound shall comply with ASTM C474 and C475.
- ITEM 4:** Insulation shall be provided and shall be either mineral wool or fiberglass. Mineral wool shall have a nominal density of 2.5 lbs/ft³. The fiberglass shall be R13. Batts shall be 16 inches wide.
- ITEM 5:** Exterior side of wall assembly shall be covered with 5/8-inch thick ASTM C79-95 Type X gypsum sheathing. Gypsum sheathing shall be fastened to wood framing with 1 5/8-inch long No. 6 Type S drywall screws spaced 8 inches on center at the edges and 12 inches on center in the field.
- ITEM 6:** Weather-resistive barrier in accordance with this report and the applicable code.
- ITEM 7:** Exterior wall covering shall be either WeatherBoards™ FiberCement Lap Siding or WeatherBoards™ FiberCement Vertical Siding. Where Lap siding is utilized the overlap shall be a minimum of 1 1/4 inches and face fastened with 2 1/2-inch-long double hot-dipped galvanized roofing fasteners with a head diameter of 3/8 inch. The fastening schedule for WeatherBoards™ FiberCement Vertical Siding shall be a maximum of 6 inches o.c. at the edges and 12 inches o.c. in the field with 8d common nails.

Figure 2 – One-Hour Fire-Resistance Rated Wall Assemble for Weatherboards™ Fibercement Lap and Vertical Siding